REMARKS

The present application was filed on July 21, 2003, with claims 1 through 18. Claims 1 through 18 are presently pending in the above-identified patent application. Claims 1, 9, 15, 17, and 18 are proposed to be amended herein.

In the outstanding Office Action, the Examiner rejected claims 1, 9, 15, and 18 under 35 U.S.C. §101 because the claimed invention is directed to non-statutory subject matter. The Examiner rejected claims 1-8 under 35 U.S.C. §102(e) as being anticipated by Gopalakrishnan et al. (United States Publication Number 6,735,695), rejected claims 9-11, 14, and 18 under 35 U.S.C. §103(a) as being unpatentable over Gopalakrishnan et al. in view of Dulude et al. (United States Patent Number 6,310,966), rejected claims 12 and 13 under 35 U.S.C. §103(a) as being unpatentable over Gopalakrishnan et al. in view of Dulude et al., and further in view of Ritter (United States Patent Number 6,657,538), rejected claim 15 under 35 U.S.C. §103(a) as being unpatentable over Gopalakrishnan et al. in view of Ballard et al. (United States Patent Application Number 2003/0225693), rejected claim 16 under 35 U.S.C. §103(a) as being unpatentable over Gopalakrishnan et al. and Ballard et al. as applied to claim 15, and further in view of Kanevsky et al. (United States Patent Number 6,092,192), and rejected claim 17 under 35 U.S.C. §103(a) as being unpatentable over Gopalakrishnan et al. and Ballard et al. in view of Kanevsky et al.

Section 101 Rejections

Claims 1, 9, 15, and 18 were rejected under 35 U.S.C. §101 because the claimed invention is directed to non-statutory subject matter. In particular, the Examiner asserts that the claims are directed to a process that does nothing more than manipulate an abstract idea and that there is no practical application in the technical arts.

Claims 1, 9, 15, 17, and 18 have been amended to require a step executed in a processor.

Applicants also note that the Supreme Court has stated that the "[t]ransformation and reduction of an article 'to a different state or thing' is the clue to patentability of a process claim." *Gottshalk v. Benson*, 409 U.S. 63, 70, 175 U.S.P.Q. (BNA) 676 (1972). In other words, claims that require some kind of transformation of subject matter, which has been held to include intangible subject matter, such as data or

signals, that are representative of or constitute physical activity or objects have been held to comply with Section 101. *See, for example, In re Warmerdam,* 31 U.S.P.Q.2d (BNA) 1754, 1759 n.5 (Fed. Cir. 1994) or *In re Schrader*, 22 F.3d 290, 295, 30 U.S.P.Q.2d (BNA) 1455, 1459 n.12 (Fed. Cir. 1994).

Thus, as expressly set forth in each of the independent claims, the claimed methods produce a transformation of biometric data to a form that is suitable for authenticating an individual, yet does not reveal the digital representation of the biometric data. This transformation provides a useful, concrete and tangible result.

Furthermore, the claimed methods also provide a comparison result that is useful in an authentication process that confirms the identity of a person.

Applicants submit that each of the claims 1, 9, 15, and 18 are in full compliance with 35 U.S.C. §101, and accordingly, respectfully requests that the rejection under 35 U.S.C. §101 be withdrawn.

Independent Claims 1, 9, 15, 17 and 18

Independent claim 1 was rejected under 35 U.S.C. §102(e) as being anticipated by Gopalakrishnan et al., claims 9 and 18 were rejected under 35 U.S.C. §103(a) as being unpatentable over Gopalakrishnan et al. in view of Dulude et al., claim 15 was rejected under 35 U.S.C. §103(a) as being unpatentable over Gopalakrishnan et al. in view of Ballard et al., and claim 17 was rejected under 35 U.S.C. §103(a) as being unpatentable over Gopalakrishnan et al. and Ballard et al. in view of Kanevsky et al. Regarding claim 1, the Examiner asserts that Gopalakrishnan discloses distorting a digital representation of one or more biometrics of a user to create a distorted biometric (i.e., "pattern of biometric information") using one or more transformations, at least one of the transformations comprising one or more non-invertible functions (i.e., hashing functions are non-invertible) (see, col. 11, lines 40-45, 51, 52, and 5-16).

Applicants note that, although Gopalakrishnan discloses transforming a signal with a hashing function, such functions are not suitable for non-invertible biometric functions because, by design, the hash function generates a very large change in the output signal (including the biometric features used for matching) in response to a very small change in the input signal. Biometric signals, however, are never exactly the same from one presentation sample to the next and, hence, an "approximate" biometric

matcher must be able to handle the small variations. These small variations in the biometric samples, however, result in much larger variations after hashing, thus rendering the required biometric matcher inoperable. Thus, while the hash function is useful for ensuring that the input has not been altered, it is not useful for transforming biometric functions that are to be used for identification or authentication.

Applicants also note that the transformations utilized by Gopalakrishnan, i.e., rotation and scaling (col. 7, lines 40-70), are *invertible functions*. Independent claim 1, as amended, requires distorting in a processor a digital representation of one or more biometrics of a user to create a distorted biometric using one or more transformations, at least one of the transformations comprising one or more *non-invertible functions*; and comparing, in response to a transaction, the distorted biometric with one or more stored distorted biometrics, so that the distorted biometric represents a user without revealing the digital representation of the one or more biometrics.

Thus, Gopalakrishnan et al. do not disclose or suggest distorting in a processor a digital representation of one or more biometrics of a user to create a distorted biometric using one or more transformations, at least one of the transformations comprising one or more non-invertible functions; and comparing, in response to a transaction, the distorted biometric with one or more stored distorted biometrics, so that the distorted biometric represents a user without revealing the digital representation of the one or more biometrics, as required by independent claim 1, as amended, do not disclose or suggest wherein said one or more distorted biometrics were created using one or more transformations of a digital representation of one or more biometrics of a user, at least one of the transformations comprising one or more non-invertible functions; and comparing in a processor the one or more requests with one or more of the records, as required by independent claim 9, as amended, do not disclose or suggest wherein said distorted biometric was created using one or more transformations of a digital representation of one or more biometrics of a user, at least one of the transformations comprising one or more non-invertible functions, as required by claim 15, as amended, do not disclose or suggest sending a user identifier and an associated digital representation of a user biometric to a remote computer that distorts the digital representation of the user biometric to a distorted biometric using one or more

transformations, at least one of the transformations comprising one or more non-invertible functions; and determining in a processor that the user identifier is associated with the distorted biometric and sending an acknowledgment to the financial company, as required by independent claim 17, as amended, and do not require sending a transaction request, a user identifier, and a distorted biometric determined in a processor using one or more transformations that transform a digital representation of one or more biometrics of a user to the distorted biometric, at least one of the transformations comprising at least one non-invertible function; and receiving an authorization for a transaction defined by the transaction request, as required by independent claim 18, as amended.

Additional Cited References

Applicants respectfully submit that independent claims 1, 9, 15, 17, and 18 are patentable over Dulude et al., Kanevsky, Ballard et al. and Ritter, alone or in combination.

Dulude et al. was also cited by the Examiner for its disclosure of receiving a user identifier associated with a biometrics and storing the user identifier in a database with its associated biometrics (col. 5, lines 15-35). Applicants note that Dulude is directed to a biometric certification system and method that implements an end-to-end security mechanism binding the biometric identification of consumers with digital certificates (col. 3, lines 31-38). Dulude does not, however, disclose or suggest one or more distorted biometrics created using one or more transformations of a digital representation of one or more biometrics of a user, at least one of the transformations comprising one or more non-invertible functions.

Thus, Dulude et al. do not disclose or suggest distorting in a processor a digital representation of one or more biometrics of a user to create a distorted biometric using one or more transformations, at least one of the transformations comprising one or more non-invertible functions; and comparing, in response to a transaction, the distorted biometric with one or more stored distorted biometrics, so that the distorted biometric represents a user without revealing the digital representation of the one or more biometrics, as required by independent claim 1, as amended, do not disclose or suggest wherein said one or more distorted biometrics were created using one or more transformations of a digital representation of one or more biometrics of a user, at least

one of the transformations comprising one or more non-invertible functions; and comparing in a processor the one or more requests with one or more of the records, as required by independent claim 9, as amended, do not disclose or suggest wherein said distorted biometric was created using one or more transformations of a digital representation of one or more biometrics of a user, at least one of the transformations comprising one or more non-invertible functions, as required by claim 15, as amended, do not disclose or suggest sending a user identifier and an associated digital representation of a user biometric to a remote computer that distorts the digital representation of the user biometric to a distorted biometric using one or more transformations, at least one of the transformations comprising one or more non-invertible functions; and determining in a processor that the user identifier is associated with the distorted biometric and sending an acknowledgment to the financial company, as required by independent claim 17, as amended, and do not require sending a transaction request, a user identifier, and a distorted biometric determined in a processor using one or more transformations that transform a digital representation of one or more biometrics of a user to the distorted biometric, at least one of the transformations comprising at least one non-invertible function; and receiving an authorization for a transaction defined by the transaction request, as required by independent claim 18, as amended.

Kanevsky et al. was also cited by the Examiner for its disclosure that the user is verified by receiving an acknowledgement from a remote computer that the user identifier is associated with the digital representation of the distorted biometric. Applicants note that Kanevsky is directed to an apparatus for providing repetitive enrollment in a plurality of biometric recognition systems based on an initial enrollment (see, Abstract). Kanevsky does not, however, disclose or suggest one or more distorted biometrics created using one or more transformations of a digital representation of one or more biometrics of a user, at least one of the transformations comprising one or more non-invertible functions

Thus, Kanevsky et al. do not disclose or suggest distorting in a processor a digital representation of one or more biometrics of a user to create a distorted biometric using one or more transformations, at least one of the transformations comprising one or more non-invertible functions; and comparing, in response to a transaction, the distorted

biometric with one or more stored distorted biometrics, so that the distorted biometric represents a user without revealing the digital representation of the one or more biometrics, as required by independent claim 1, as amended, do not disclose or suggest wherein said one or more distorted biometrics were created using one or more transformations of a digital representation of one or more biometrics of a user, at least one of the transformations comprising one or more non-invertible functions; and comparing in a processor the one or more requests with one or more of the records, as required by independent claim 9, as amended, do not disclose or suggest wherein said distorted biometric was created using one or more transformations of a digital representation of one or more biometrics of a user, at least one of the transformations comprising one or more non-invertible functions, as required by claim 15, as amended, do not disclose or suggest sending a user identifier and an associated digital representation of a user biometric to a remote computer that distorts the digital representation of the user biometric to a distorted biometric using one or more transformations, at least one of the transformations comprising one or more non-invertible functions; and determining in a processor that the user identifier is associated with the distorted biometric and sending an acknowledgment to the financial company, as required by independent claim 17, as amended, and do not require sending a transaction request, a user identifier, and a distorted biometric determined in a processor using one or more transformations that transform a digital representation of one or more biometrics of a user to the distorted biometric, at least one of the transformations comprising at least one non-invertible function; and receiving an authorization for a transaction defined by the transaction request, as required by independent claim 18, as amended.

Ballard was also cited by the Examiner for its disclosure of receiving a user identifier, checking the user identifier with information about one or more accounts of the user, verifying the identity of the user by comparing the received user identifier with a stored user identifier, and granting authorization for the transaction if the information about the account is in good standing.

First, Ballard does not disclose or suggest that the signature *does not reveal the digital representation of the biometric or is non-invertible.* In fact, Ballard teaches that, "in the fingerprint biometric subsystem, a capacitive apparatus may be

utilized to capture a biometric signature, preferably in the form of a *raw image* 605 of the fingerprint." (Paragraph 127.) A raw image is necessary since Ballard teaches that the fingerprint search and matching algorithm relies on minutia based on a number of features (paragraph 77). (See also, FIG. 10; paragraphs 148 and 149.) Thus, Ballard teaches that the digital representation of the biometric is revealed or is invertible.

Second, Ballard teaches that the signature file is encrypted and stored, but does ***not*** disclose or suggest that the signature file is *transmitted or is used in the identification step* (step 930).

Finally, since the signature is encrypted in step 910, and the encryption keys for sending the transactional data (including the biometric data; see, paragraph 137) are not created until step 920, it would not be possible to utilize the encrypted signature file for the transmission and identification steps (steps 920 and 930, respectively).

Thus, Ballard et al. do not disclose or suggest distorting in a processor a digital representation of one or more biometrics of a user to create a distorted biometric using one or more transformations, at least one of the transformations comprising one or more non-invertible functions; and comparing, in response to a transaction, the distorted biometric with one or more stored distorted biometrics, so that the distorted biometric represents a user without revealing the digital representation of the one or more biometrics, as required by independent claim 1, as amended, do not disclose or suggest wherein said one or more distorted biometrics were created using one or more transformations of a digital representation of one or more biometrics of a user, at least one of the transformations comprising one or more non-invertible functions; and comparing in a processor the one or more requests with one or more of the records, as required by independent claim 9, as amended, do not disclose or suggest wherein said distorted biometric was created using one or more transformations of a digital representation of one or more biometrics of a user, at least one of the transformations comprising one or more non-invertible functions, as required by claim 15, as amended, do not disclose or suggest sending a user identifier and an associated digital representation of a user biometric to a remote computer that distorts the digital representation of the user biometric to a distorted biometric using one or more transformations, at least one of the transformations comprising one or more non-

invertible functions; and determining in a processor that the user identifier is associated with the distorted biometric and sending an acknowledgment to the financial company, as required by independent claim 17, as amended, and do not require sending a transaction request, a user identifier, and a distorted biometric determined in a processor using one or more transformations that transform a digital representation of one or more biometrics of a user to the distorted biometric, at least one of the transformations comprising at least one non-invertible function; and receiving an authorization for a transaction defined by the transaction request, as required by independent claim 18, as amended.

Ritter was also cited by the Examiner for its disclosure that the distorted biometric is cancelled by allowing a user to replace the distorted biometric with a second distorted biometric. Applicants note that Ritter is directed to a method for authenticating persons, wherein video information of certain body features associated with a user or a user group is recorded in a point of presence (POP), and such recorded video information is processed to derive biometric keys, which are stored in tables of a biometric server and in a SIM-card of the user. (See, Abstract.)

Thus, Ritter does not disclose or suggest distorting in a processor a digital representation of one or more biometrics of a user to create a distorted biometric using one or more transformations, at least one of the transformations comprising one or more *non-invertible functions*; and comparing, in response to a transaction, the distorted biometric with one or more stored distorted biometrics, so that the distorted biometric represents a user without revealing the digital representation of the one or more biometrics, as required by independent claim 1, as amended, does not disclose or suggest wherein said one or more distorted biometrics were created using one or more transformations of a digital representation of one or more biometrics of a user, at least one of the transformations comprising one or more non-invertible functions; and comparing in a processor the one or more requests with one or more of the records, as required by independent claim 9, as amended, does not disclose or suggest wherein said distorted biometric was created using one or more transformations of a digital representation of one or more biometrics of a user, at least one of the transformations comprising one or more non-invertible functions, as required by claim 15, as amended, does not disclose or suggest sending a user identifier and an associated digital

representation of a user biometric to a remote computer that distorts the digital representation of the user biometric to a distorted biometric using one or more transformations, at least one of the transformations comprising one or more non-invertible functions; and determining in a processor that the user identifier is associated with the distorted biometric and sending an acknowledgment to the financial company, as required by independent claim 17, as amended, and does not require sending a transaction request, a user identifier, and a distorted biometric determined in a processor using one or more transformations that transform a digital representation of one or more biometrics of a user to the distorted biometric, at least one of the transformations comprising at least one non-invertible function; and receiving an authorization for a transaction defined by the transaction request, as required by independent claim 18, as amended.

Consequently, Applicants respectfully submit that independent claims 1, 9, 15, 17, and 18 are patentable over Gopalakrishnan et al., Dulude et al., Ritter, Ballard et al., and Kanevsky et al., alone or in combination.

Dependent Claims 2-8, 10-14 and 16

Dependent claims 2-8 were rejected under 35 U.S.C. §102(e) as being anticipated by Gopalakrishnan et al., claims 10, 11, and 14 were rejected under 35 U.S.C. §103(a) as being unpatentable over Gopalakrishnan et al. in view of Dulude et al., claims 12 and 13 were rejected under 35 U.S.C. §103(a) as being unpatentable over Gopalakrishnan et al. in view of Dulude et al., and further in view of Ritter, and claim 16 was rejected under 35 U.S.C. §103(a) as being unpatentable over Gopalakrishnan et al. and Ballard et al. as applied to claim 15, and further in view of Kanevsky et al.

Claims 2-8, 10-14, and 16 are dependent on claims 1, 9, and 15, respectively, and are therefore patentably distinguished over Gopalakrishnan et al., Dulude et al., Ritter, Ballard et al., and Kanevsky et al. (alone or in any combination) because of their dependency from amended independent claims 1, 9, and 15 for the reasons set forth above, as well as other elements these claims add in combination to their base claim.

Conclusion

Applicants respectfully submit that the claims of record are patentable over the cited art. If any outstanding issues remain, or if the Examiner has any further suggestions for expediting allowance of this application, the Examiner is invited to contact the undersigned at the telephone number indicated below. The Examiner's attention to this matter is appreciated.

Respectfully submitted,

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